



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

## Notes on *Viburnum* and the assemblage Caprifoliaceae

W. L. MCATEE

(WITH ONE TEXT FIGURE)

For some years the writer collected and studied the plants known as Caprifoliaceae, especially those of the genus *Viburnum*, with a view of revising at least the American forms of the latter. As realization of this project does not seem likely, a few matters of general interest arising during the investigation are here set forth.\*

*Stellate pubescence in Viburnum.*—Although used in American botanical manuals the term stellate is not properly applied to the pubescence in our species of the genus *Viburnum*. True stellate pubescence, present in some exotic species, consists of trichomes having single points of attachment but which higher up are expanded or branched in a radiate manner. The pubescence of the United States species of *Viburnum* consists of simple hairs or of groups of such hairs, in the latter case each with its own attachment to the epidermis. The proper adjective to apply to these grouped hairs is fasciculate, a term which fits them exactly and which, if not employed in such instances, falls into unfortunate disuse. Since the fasciculation may involve any number from two to some twenty hairs, it is not a very good character to use in keys to the species. Still more unsatisfactory are descriptions of the vestiture in which the misleading modifier "stellate" is used for the denser tufts, as it implies a more fundamental difference than really exists between species which intergrade through every degree of fasciculation of the pubescence.

*Relationship of Viburnum nudum and Viburnum cassinoides.*—The characters of these forms intergrade extensively; the length of peduncle relative to that of cyme and the crenulations of the leaf margin, characters usually cited in keys, are fully connected by individual variations. The following with reference to the leaf

---

\* The writer is obliged to Messrs. S. F. Blake and P. C. Standley for reading this paper and for making beneficial suggestions.

margins in these species may be of interest. In both, the leaf margin is more or less inrolled and the revolute character is most marked in *V. nudum*, which is described as having chiefly entire leaves. *Viburnum cassinoides* is described as generally crenulate-denticulate; however, the manuals note that each species occasionally has the leaf form of the other. If the revolute margin of the leaf of *V. nudum* be unrolled, crenulations are visible; thus, while the leaf really possesses the character supposed to be distinctive of *V. cassinoides*, the rolling in of the margin hides it and gives the leaf the appearance of entirety. The crenulations also are visible in many *V. nudum* leaves without unrolling them, that is, the margin is only folded back and the crenulations lie flat against the lower surface of the leaf. Both types can be found on a single plant as can also both long and short peduncles. The most reliable character for separating *V. nudum* and *V. cassinoides* is the shape of the pit of the fruit. The former has a simple, thin, lenticular pit, the latter an elongate, fusiform and sulcate one. Even these differences are more or less obscured by variations in certain specimens, but extreme southeastern *V. nudum* seems typical and so do northern specimens of *V. cassinoides*. Despite general inosculation of characters, therefore, the writer is inclined to rank these two forms as species, which hybridize more or less throughout the extensive common portion of their ranges.

*Whorled leaves in Caprifoliaceae.*—The possession of whorled leaves has a number of times been cited as one of a combination of characters distinguishing the Rubiaceae from the Caprifoliaceae. Seeing that this does not hold, the writer has noted, and in most cases collected, specimens showing verticillate leaves in various Caprifoliaceae. Such leaves are found most frequently on strong root-shoots, and according to the theory elaborated by Dr. R. T. Jackson,\* indicate the ancestral condition. Species of *Viburnum* on which whorled leaves have been seen include: *V. Opulus*, *V. acerifolium* (whorled branches also), *V. dentatum*, *V. pubescens*, *V. Lentago*, and *V. Lantana*. *Sambucus canadensis* with verticillate leaves has been collected also, as well as the following species of *Lonicera*: *L. japonica*, *L. tatarica*, *L. fragrantissima*, *L. hispidula*, and *L. thibetica*. The last species as seen in the Arnold Arbore-

---

\* Mem. Boston Soc. Nat. Hist. 5: 89-153. pl. 16-25. April, 1899.

tum frequently, one might almost say usually, has the leaves in whorls (three's, sometimes four's). The structure of plants with opposite leaves readily lends itself to the production of verticils, and as instanced here, the two types of foliation are hardly distinct enough to be given much weight in the major phases of classification.

*Stipules in the Caprifoliaceae.*—The most persistent efforts to name characters that will distinguish the Caprifoliaceae from the Rubiaceae have been centered on stipules. It being untrue that the assemblage of plants known as Caprifoliaceae entirely lacks stipules, various niceties of language have been used to indicate a difference where practically none exists. "Usually exstipulate," lacking "true stipules," and stipules if present adnate to the petiole are some of the expressions used. The first statement is more or less true but, demanding qualification, fails as a satisfactory character for distinguishing families. With respect to the second it must be said that special students of stipules agree in attributing such organs to the Caprifoliaceae.\* Relative to the third definition, I may say that I have before me (gathered Maywood, Virginia, today, July 4, 1920) a piece of *Sambucus canadensis* with well-developed stipules on the petioles of leaves just beneath inflorescence, one of which when its leaf was stripped off remained adnate to the stem. In a specimen of *Viburnum Opulus* collected in the grounds of the United States Department of Agriculture, May 25, 1920, the stipules† are connected by wings which form a stipular cup completely encircling the stem (see FIG. 1). In some Rubiaceae the interpetiolar stipules are reduced to a mere stipular line and stipular lines are present in various caprifolios, notably *Sambucus*; moreover, what essential difference is there between the shallow cups formed by the interpetiolar stipules in some Rubiaceae and the perfoliate leaves of *Triosteum* and *Lonicera*? The idea that true stipules can be distinguished

\* See an excellent paper on The Nature and Origin of Stipules (with review of the literature), by A. A. Tyler, Ann. N. Y. Acad. Sci. 10: 1-49. pl. 1-3. April, 1897.

† These stipules are unusually large, and bear glands on their stalks, thus suggesting that they are relics of a progenitor of the species having compound leaves. Similar stipules were collected on the same species in the Washington Monument Grounds, D. C., May 28, 1910, their likeness to leaves being greater, since they showed a tendency to lobing.

from the false by their pertaining to the stem rather than to the petiole appears to take little account of the fact that the petiole itself is a product of the stem and that in so plastic a kingdom as plants the appendages of the petiole and those of the stem from which it springs can not be otherwise than connected by every possible gradation. In the most typically stipulate plants, such as *Rosa* and *Trifolium*, the stipules are lobes at the base of the petioles, to which they adhere when the leaves are torn off. Even though they are true stipules they certainly are not adnate to the stem. All in all, it is certain that the stipules of Caprifoliaceae can

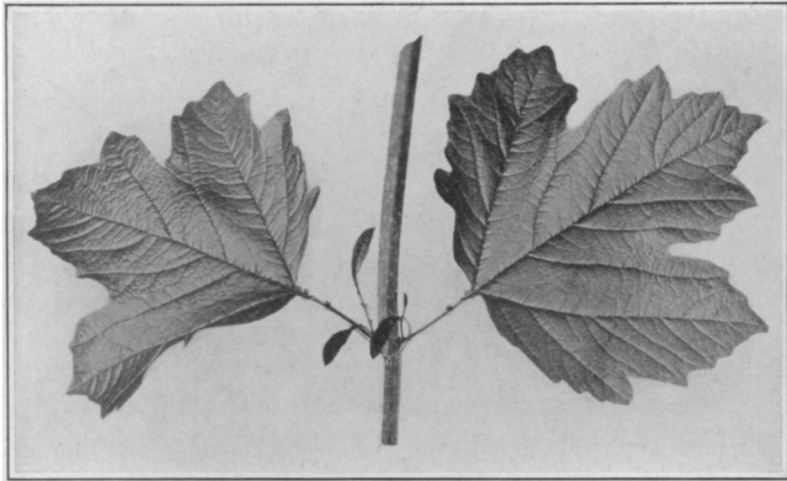


FIG. 1. Foliate development of stipules in *Viburnum Opulus*.

not be denied and judging from efforts that have been made, it is useless to seek a wording that will distinguish them in all of their phases from those of the Rubiaceae. Stipules are known in four of the genera (*Sambucus*, *Viburnum*, *Leycesteria*, *Lonicera*) of Caprifoliaceae, and perfoliate leaves in three (*Lonicera*, *Leycesteria*, *Triosteum*); and if we descend to the criterion of stipular line, as is done to evidence the genuineness of some Rubiaceae, we need exclude no caprifolios except those of the genus *Alseuosmia* which have alternate leaves.

*Do the Caprifoliaceae merit family rank?*—A rigorous yet entirely fair test of the validity of a classificatory group is: If

merged with its nearest relatives, will it remain a unit? Thus the Cichorieae, sometimes considered a family and sometimes ranged with the Compositae, do not in the latter process become scattered through the tribes of the Compositae but retain their integrity as a group. What happens to the Caprifoliaceae when this test is applied? It immediately becomes apparent that they have no character in common that will hold them together; they run to tribes in all parts of the Rubiaceae, some have one-seeded, others more than one-seeded carpels; some have dry fruits, others berries; some have the ovules suspended from the top of the ovaries, others from the septa. The variety of character with regard to verticillation of the leaves and the presence of stipules has been sufficiently set forth in preceding paragraphs. Some of the effects of this diversity upon their relation to the Rubiaceae are stated by Schumann, as follows: "The Diervillieae, for instance, have a surprising similarity in flower, fruit, and seed structure to the Cinchoneae; in the last analysis they are differentiated only by the lack of stipules in the former. Certain forms of Lonicereae, which are characterized by stipules (*Pentaptyxis*), incline likewise to the tribe of Rubiaceae with numerous seeds, while some species of *Viburnum*, which are provided with stipules, harmonize with the Guettardeae."\*

It would appear, therefore, that the Caprifoliaceae can not pass a test which should leave any satisfactory plant family intact, and with all due respect to those most erudite botanists, Bentham and Hooker, it would appear that their statement that the Caprifoliaceae are "a very natural order"† was made without sufficient consideration. Schumann appears to be more correct when he says "The Rubiaceae show the closest relationship to the Caprifoliaceae; various groups of them are so intimately related that one can raise no important objection to Baillon's view that the two families blend into one."

An even stronger statement is made by Fritsch relating to the group upon which he specialized: "The Caprifoliaceae are so closely allied to the Rubiaceae that it is impossible to give even one positive differential character for the two families."‡ It would

---

\* Engler & Prantl, Die natürlichen Pflanzenfamilien 4<sup>4-5</sup>:13. 1897.

† Genera Plantarum 2: 1. 1873.

‡ Engler & Prantl, Die natürlichen Pflanzenfamilien 4<sup>4-5</sup>: 160. 1897.

appear, therefore, that the Caprifoliaceae have been treated as a separate family from the Rubiaceae on chiefly hypothetical grounds. Artificiality is hardly called for in this case since the number of genera concerned, namely ten, is so small in proportion to the 350 of Rubiaceae that separating them does not significantly decrease the complexity of the larger group.